REMARKS

Present Status of the Application

The Office Action rejected claims 15-17 and 21 under 35 U.S.C. 102(e), as being anticipated by Morrow et al. (U.S. 2004/0058547). The Office Action rejected claims 18-20 and 22-23 under 35 U.S.C. 103(a) as being unpatentable over Morrow in view of Maiz (US 6,794,755).

Applicants have amended claim 15 to more clearly define the present invention. After entry of the foregoing amendments, claims 15-23 remain pending in the present application, and reconsideration of those claims is respectfully requested.

Discussion of Office Action Rejections

Applicants respectfully traverse the 102(e) rejection of claims 15-17 and 21 because Morrow et al. (U.S. 2004/0058547) does not teach every element recited in these claims.

In order to properly anticipate Applicants' claimed invention under 35 U.S.C 102, each and every element of claim in issue must be found, "either expressly or inherently described, in a single prior art reference". "The identical invention must be shown in as complete details as is contained in the .... claim. Richardson v. Suzuki Motor Co., 868 F. 2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)." See M.P.E.P. 2131, 8th ed., 2001.

The present invention is in general related a structure of metal interconnects as claim 15 recites:

Claim 15. A structure of metal interconnects, comprising:

a first dielectric layer, having a first opening therein;
a first metal layer, formed in the first opening; and
a first protective layer, formed on the surface of the first metal layer not covered by the first dielectric layer, wherein the first protective layer is formed from a mixture of the first metal layer and a first film layer, the first film layer is reactive with the first metal layer but non-reactive with the first dielectric layer, ***and a top surface of the first dielectric layer around the first opening is exposed.***

Morrow fails to teach or suggest that the first protective layer is formed from a mixture of the first metal layer and a first film layer, the first film layer is reactive with the first metal layer but non-reactive with the first dielectric layer, ***and a top surface of the first dielectric layer around the first opening is exposed.*** In Morrow's reference, a metal material 226 is formed onto the ILD 210 and the interconnect 224 (Fig. 2H, paragraph [0017]). The metal material 226 may comprise a material that will automatically react with the exposed upper portion of the ILD 210 as the metal material 226 is being deposited to form a metal oxide layer 228 (Fig. 2I, paragraph [0019]). In other words, ***the ILD 210 is covered by the metal oxide layer 228*** (Fig. 2I-2J). However, in claim 15 of the present invention, the first protective layer is formed from a mixture of the first metal layer and a first film layer, and the first film layer is reactive with the first metal layer ***but non-reactive with the first dielectric layer***, and ***a top surface of the first dielectric layer around the first opening is exposed.*** Hence, Morrow fails to teach or disclose each and every element of claim 15.

For at least the foregoing reasons, Applicant respectfully submits that independent claim 15 patently define over the prior art references, and should be allowed. For at least the same reasons, dependent claims 16-17 and 21 patently define over the prior art as well.

The Office Action rejected claims 18-20 and 22-23 under 103(a) as being unpatentable over Morrow in view of Maiz. Applicants respectfully traverse the rejection for at least the reasons set forth below.

Applicants submit that, as disclosed above, Morrow fails to teach or suggest each and every element of claim 15, from which claims 18-20 and 22-23 depend. Because independent claim 15 patently defines over the prior art references, and should be allowed, its dependent claims 18-20 and 22-23 patently define over the prior art as well.

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CONCLUSION

For at least the foregoing reasons, it is believed that the pending claims are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,
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